



MEMORANDUM

To: Interested Parties

From: W. Douglas Beisch, Jr., P.E.
Program Manager – Water Resources Engineering

Subject: **Virginia Stormwater Management Regulations
Update on Nutrient Reduction Criteria and Costs**

Date: January 22, 2009

cc: Sr. Project Managers

Stormwater Nutrient Reduction Criteria Update

Background

DCR convened a technical committee process in 2006 to develop updates to the Virginia Stormwater Management Program (VSMP) technical criteria and administrative criteria. The main impetus/goal for this effort was the ultimate delegation of VSMP permit issuance to local governments, but the technical criteria were significantly revisited and modified during the process. The original Technical Advisory Committee (TAC) (WEG did not participate) convened through 2007, where most of the regulatory framework and nutrient reduction target setting (0.28 lb/ac/yr TP) were established. Based on the original targets set by the TAC, WEG voiced our concerns about the technical achievability and compliance options for meeting such targets. In 2007, as a result of the original committee discussions and input from WEG and other stakeholders, DCR adopted a stronger focus on evaluating compliance mechanisms for these new nutrient targets. DCR took several steps in 2007 and 2008 to address technical achievability:

- DCR contracted with the Center for Watershed Protection in 2007 to develop compliance methods and spreadsheets to address technical requirements
- DCR convened a new Technical Advisory Committee (TAC) in 2008 to revisit the regulatory language. WEG was invited to participate in this TAC, along with a number of other technical professionals, who provided significant input during this process toward meeting the previously established 0.28 lb/ac/yr TP load target.
- DCR coordinated with the American Society of Civil Engineers (ASCE) to develop a series of workshops around Virginia to solicit input from the design community

WEG staff have been working with ASCE, CWP and DCR TACs to help identify costs of the proposed regulations, technical and implementation issues, and provide suggestions for refinements and adjustments to the regulatory language and technical methodologies. Several significant refinements have been made based on input from us and other stakeholders and the results of the

ASCE workshops, resulting in updates to the methods. Furthermore, we are advocating, through ASCE and other contacts, that targeted offset programs be allowed for compliance with the water quality criteria to introduce market-driven cost controls, given that certain sites will have costs which well exceed the incremental benefits.

Costs – Case Studies

WEG prepared a number of case studies to evaluate the potential cost implications. In tough economic times, it becomes even more important to inform regulatory decisions with useful case studies and cost data to evaluate technical criterion for both achievability and cost-effectiveness. The cost studies were also specifically requested by the James River Association in an effort to help generate additional cost data for DCR's use in evaluating the economics of the regulations. These data were lacking at the time we initiated the case studies (August 2008). Further, WEG developed several useful insights about the technical methodology that can help to direct programmatic efforts at improving the methods. Although our limited number of case studies have been aggregated with other data gathered by DCR for use in the economic study, DCR has begun to release the cost data they have gathered (see below). Our clients have had numerous questions about the results of the costs assessments. The following provides a brief summary of the results from our five case studies for new development and one case study for redevelopment:

- The technical requirements did appear to be achievable on the sites evaluated, irrespective of cost.
- The various case studies and costs cited did consider costs associated with loss of developable density/yield needed for compliance (compared to the current requirements).
- The costs per residential lot (3 residential case studies) were evaluated under multiple scenarios (the minimum current compliance criteria and the actual proffered stormwater implementation). One site, a low density residential development (estate lots), resulted in sufficiently low nutrient loadings that no water quality treatment was required under the current or proposed criteria. The results of the other two residential case studies showed per lot increased (incremental costs) ranging from approximately \$1,700-\$6,200/residential unit.
- Costs differences versus basic/minimal compliance criterion were at the higher end of the range. Given that development and stormwater planning is influenced by a number of other factors external to the basic compliance criteria (e.g. proffer commitments, permit-related commitments, etc.), the incremental costs of the new regulations versus the actual implementations were not as severe.
- These costs should not be considered minimum and maximum. We have no doubt that there will be sites where compliance may be more costly, or very difficult if not impracticable, and that there will be other sites where compliance may be slightly easier. However, our sites were selected as being fairly representative of the typical sites we see.
- Including commercial site implementations, the incremental cost for additional pollutant removal varied widely. Costs per pound of annual Total Phosphorus (TP) removal ranged from \$8,000 - \$50,000 for new development.
- Incremental costs per impervious acre ranged similarly showed significant variability, ranging from \$2,000-\$52,000/impervious acre.
- Redevelopment costs were evaluated for a variety of scenarios. In the actual case study employed, the incremental cost per lb annual TP removal was approximately \$76,000. Costs for redevelopment are expected to vary even more widely due to dramatic differences in ease of retrofitting on given sites and economy of scale or lack thereof.

- In most new development instances, approximately half of the incremental increase in required pollution reductions was associated with the establishment of a 0.28 lb/ac/yr TP target (versus current requirements of 0.45), which drives down the “bottom line”. The other half of the increased load reduction was associated with spreadsheet accounting for nutrient loadings for managed pervious cover (i.e. turf), resulting in increases to the “top line.” The latter has historically been disregarded in nutrient load computations in Virginia, but has been identified by the CWP as a significant contributor of nutrients.

WEG Concerns

In our opinion, the cost data suggest that an offset program would be a critical piece to the implementation of these criteria in order to ensure that available monies for water quality protection, in difficult economic times, are directed in the most efficient manner to projects with the most benefit. Further, the use of an offset program could reduce the number of more expensive small-scale implementations of difficult to maintain technologies (which may yield little in the way of nutrient reduction benefit), in favor of better programmatic solutions. It is our understanding that offset legislation has already been introduced in the current session to specifically address this issue (HB2168). Furthermore, the Economic Impact Analysis for the regulations has recently been released by DCR and references off-site options and pro rata programs as, “important and critical” features of the regulations. WEG will continue to work with ASCE, DCR, CWP and various other groups in order to assist or provide suggestions for refinements to the method, explore market-driven strategies and other compliance tools, and address regulatory language which may be problematic.

We further have some significant concern about how these regulations may affect projects which are already “in the pipeline.” Given that environmental permitting, zoning and preliminary planning for developments of any scale can take years to complete and can be very costly, the shifting sands of regulation can often result in dramatic impacts to land plans and result in significant fiscal impacts for our clients. While we understand that the state, and many localities, may develop some form of vesting policy, we still remain concerned given that:

- Medium and large-scale projects normally involve multi-phased build outs which may extend far beyond VSMP permit timeframes
- That these multi-phase projects often have not secured site plan approvals for latter stages
- That these stormwater regulations will be administered locally through the site plan approval process, and given
- That these criteria are implemented through a general discharge permit, for which vesting, in our experience, has typically not been applied

We see a strong possibility that these criteria could be applied to projects for which significant planning, approvals and permitting efforts have already been undertaken under the old criterion. This creates a situation where the development industry, already under significant financial stress, may experience further adverse impacts, even for projects which had been properly planned from the outset under the criteria in place at the time. We will continue to advise that evaluation of these criteria give consideration to strong vesting and grandfathering language for projects which have received approvals (even early stage reviews and approvals) through local, state or federal agencies, and that such grandfathering be extended for the life of the project.

Moving Forward

WEG's efforts to date have been focused constructively to help suggest policies that we perceive a need for and to get the word out to the professional community (through ASCE) to generate additional input for consideration of the regulations and the supporting compliance methods. WEG will also be compiling our own comments on the regulations once the public comment period is open and DCR begins soliciting input from the public. We envision presenting the results of our case studies in greater detail at upcoming conferences and workshops, and would be happy to provide copies of those presentations to you, once they are prepared. Further, we would be happy to meet with developers and engineers to review the potential effects on your projects. Please feel free to contact us if you would like additional information or to schedule a meeting.

James River Association
Analysis of Proposed Virginia Stormwater Regulations
Performed by Williamsburg Environmental Group
Summary Table

Type of Development	Size (acres)	Units (Commercial Space/ Residential Units)	Soil Class	Land Cover (%): Imp/Turf/Forest	Annual TP Load Current/Proposed (lb)	Annual TP Reduction Required - Current/Proposed (lb) Current/Proposed (%)	Additional Actions Required to Meet Proposed Regulatory Requirements	Stormwater Costs Under Current Regulations	Stormwater Costs Under Proposed Regulations	Attainment of Proposed Criteria On-Site
High Impervious – Big Box	15.6	100,000 s.f.	B	67%/33%/0%	23.23 lb / 24.99 lb	16.21 lb. / 20.62 lb. 70% / 83%	New criteria can be met with current underground detention/stormwater filtration and upgrading large wet pond from type I to type 2 treatment level.	\$500,000	\$540,000- \$570,000	Yes
High Impervious – Office Complex	11.1	180,000 s.f.	C	66%/32%/2%	16.3 lb / 17.62 lb	11.4 lb. / 14.4 lb. 69% / 82%	The current stormwater design utilizes an LID approach with 25,000 s.f. of bioretention facilities and soil amendments. New requirements could be met with a type 2 wet pond. Meeting new criteria with LID approach would require upgrading the bioretention to meet the new design standards but with a similar area.	Conventional - \$125,000 LID (As designed) - \$180,000	Conventional - \$245,000 LID – \$240,000	Yes
Residential – 1/5 acre lots	55	205 houses	B/C	40%/53%/7%	51.41 lb / 61.63 lb	26.2 lb. / 45.4 lb. 52% / 75%	Upgrade and expand dry detention basin to type 2 wet pond, in addition to the other planned stormwater facilities.	Conventional- \$550,000 LID (As designed) - \$745,000	Conventional – \$900,000 LID – \$1,495,000	Yes
Residential – 1/2 acre lots	14.9	25 houses	C	Traditional 25%/58%/17%	9.36 lb / 12.98 lb	2.76 lb./8.81 lb. 30% / 68%	Change from 9.583 s.f. of bioretention and swales to 9,500 s.f. of level 1 dry swale, 700 l.f. of grassed swale, 5000 s.f. of soil amendments and 50 rain barrels.	Conventional - \$44,000 LID (As designed) - \$144,000	\$198,500	Yes
				Cluster 20%/63%/17%	7.86 lb / 11.15 lb	1.26 lb / 6.97 lb 16% / 63%				
Residential – 3 acre lots	270	35 houses	B/C	5%/16%/79%	58.48 lb / 49.94 lb	0 lb. / 0 lb. -108% / -51%	None. No stormwater controls required.	\$0	\$0	Yes
Redevelopment: Office/Retail	1.65	16,000 s.f.	N/A	Imp. Pre – 65% Imp. Post – 75%	2.71 lb. / 2.86 lb.	0.57 lb. / 0.80 lb. 21%/28%	Existing detention basin is converted to extended detention basin, 1/6 th of the new pavement is permeable and 2000 gallon cistern.	\$11,250	\$28,750	Yes

Note: “LID (As designed)” refers to sites which were actually designed using low impact development techniques for stormwater management, rather than conventional stormwater facilities. In these cases, a conventional stormwater management design was also assessed for comparison purposes.